



DNR Tanks Update

Iowa Department of Natural Resources

Fall 2006

DNR introduces new compliance inspection program

In an effort to increase compliance and prevent leaks, new rules will require owners and operators of underground storage tanks (USTs) to hire a state certified compliance inspector.

The DNR initiated the meetings to discuss the best approach to meet program objectives, particularly in light of decreased UST program funding.

The DNR is in the process of providing temporary

hire a certified compliance inspector. The inspector will conduct the inspection according to the DNR inspection form and manual. A copy of the report will be submitted to the DNR and to the owner/operator.

For most problems found, the owner/operator will have 60 days to correct the problem and provide the compliance inspector documentation the problem was corrected. The inspector will report to the DNR which problems have been corrected.

The DNR will conduct any required enforcement action. Audits by the DNR field offices will be conducted on a percentage of the compliance inspections. DNR follow-up inspections will be conducted as needed.

The DNR will continue to observe tank closures, investigate reported releases, check on corrective actions and remediation systems at leaking UST (LUST) sites and attend to sites with ongoing problems.

compliance inspector certification for licensed installers or licensed installation

inspectors interested

in being a compliance inspector until a more formal process is developed.

Temporary certification of inspectors should be completed by Dec. 1, 2006. The DNR will be notifying owners, through letters, of the inspection requirement. A list of certified compliance inspectors will be provided on the DNR website at www.iowadnr.gov/land/ust/ or upon request.

It will be the owner or operator's responsibility to



A certified compliance inspector checks for leaks.

This inspection will check UST systems for compliance with state regulations and **must be conducted every two years** with the first inspection required by Dec. 31, 2007.

The DNR developed the certified compliance inspection program as the result of a series of meetings with petroleum marketers, the UST insurance community, the environmental community and other stakeholders.

In this issue:

2

Record number of inspections; Properly install flex connectors

3

Checking sumps saves; 2007 legislative changes

4-5

New technology: Enhanced Leak Detection

6

Monitoring wells: placement and maintenance important

7

Changes required by Federal Energy Act

8

UST Fund Board to transfer installer licensing program

Certified compliance inspectors:

Visit www.iowadnr.gov/land/ust/ after Nov. 14 for a full list of certified compliance inspectors.

DNR conducts record number of inspections; finds spill bucket issues

The DNR conducted its largest number of inspections in 2006 with almost 1,300 inspections.

From July 1, 2005 to June 30, 2006, the DNR's six environmental services field offices each conducted over 200 inspections for a grand total of 1,293, the largest number of UST inspections ever conducted in one year by the DNR.

In state fiscal year 2006, the DNR issued 769 UST violations. Tank release detection (RD) violations accounted for most of the violations issued (180). These violations ranged from not conducting release detection to invalid testing, such as not testing when the tank volume is at or near the level it is filled.

Inspectors paid careful attention to spill buckets, the next highest number of violations (131). As mentioned in the spring 2005 edition of DNR Tanks Update, faulty spill buckets account for most releases at UST sites (see chart at right). Spill buckets get a lot of abuse, which shortens their useful life, normally fewer than 10 years.

According to a March 2006 study completed by the Florida Department of Environmental Quality,

spill buckets were responsible for almost half of the of reported leaks (159 out of 373) in their state. Spill bucket connections and damaged spill buckets, with cracks or holes in the plastic spill buckets or corrosion in metal spill buckets and separation from the fill pipe, lead to releases. Other areas where problems occur in the form of vapor and liquid phase releases include:

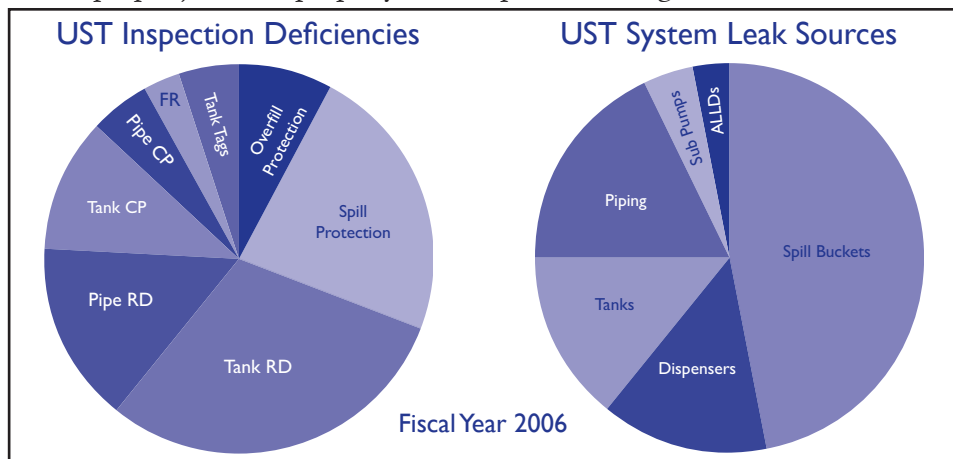
- Automatic tank gauge access rise caps and signal cable penetrations
- Piping connections
- Dispenser (fittings, gaskets, seals)
- Spill bucket connections and drain valves (significant vapor and liquid releases)
- Improper joints, improperly

seated rings and gaskets, moving joints while curing

- Threaded fittings, fiberglass reinforced plastic (FRP) to steel, scarred threads from bad dyes
- Bruised or crimped piping
- Flex connectors
- Shear Valves
- Transporters

The coming year will be a transition year as the DNR moves to a new UST inspection program in which owner/operators will hire temporarily certified compliance inspectors to inspect their UST systems.

DNR UST inspectors will conduct audits of the inspections, enforcement where needed, work requests from the central office, complaint investigations and other duties.



Properly install flex connectors

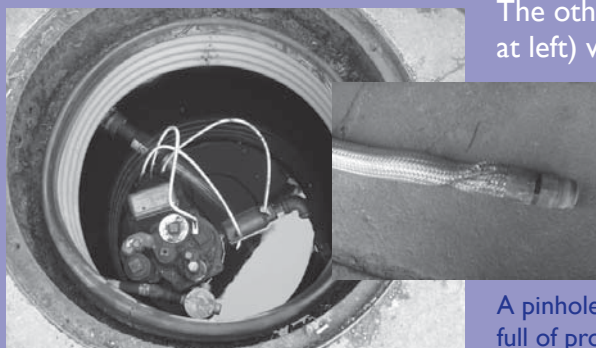
The last edition of DNR Tanks Update covered flex connectors as the cause of several releases. In September 2006, two owner/operators reported releases caused by

ruptures in flex connectors. One involved free product and migrating petroleum vapors. One flex connector revealed a perforation from normal wear (at the bend or elbow). The other flex connector (pictured at left) was twisted, pinched and kinked; any one of which is reason to replace it.

Flex connectors must not be bent beyond the minimum bend radius allowed by the manufacturer,

nor should they ever be installed with a kink or twist. Observe the stainless steel braiding of your flex connector to ensure they are installed properly.

Talk to your Iowa licensed installer to determine when you should replace your flex connectors. They are subject to line shock as well as high stress and pressure especially where there is a bend in the flex connector.



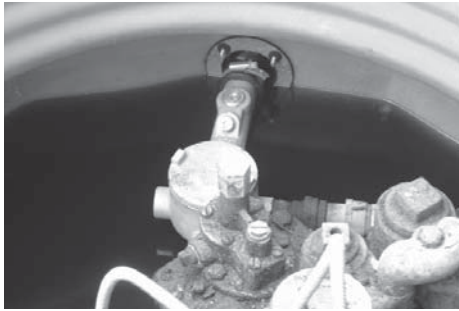
A pinhole-sized leak from a twisted or kinked flex connector (inset) can lead to a sump full of product (at left).

Checking sumps saves in the long run

Checking your sumps on a regular basis, like once a week, can help you avoid serious problems.

If you don't check your sumps, you may not find out you have a release until adjacent property owners report vapor in their buildings.

Pinhole size leaks in flex connectors may not be detected through leak detection monitoring and may not activate the line leak detector. Opening the sump on a regular basis to check for saturated backfill or



product in a contained sump lowers your risk of lost profits, lost product, environmental damage and other liabilities.

Several times this past summer, DNR field office personnel investigated reports of petroleum vapors in buildings (via utility lines) adjacent to UST facilities. Most of these facilities reported no loss of product through release detection methods, yet free product was found in monitoring wells and, in one case, flowing down a canal.

Even a pinhole size leak in a flex connector can lead to an expensive and significant loss. In one instance, a leak went undetected until vapors were reported in nearby buildings and product was discovered in moni-

toring wells. Product leaked from the flex connector in what was believed to be a liquid-tight turbine sump through a joint where the sump and riser connect. The resin used to connect the riser to the sump had degraded.

While you may have a sensor in your sump to alert you of a leak, don't depend on that alone. Further, the sump you think is liquid-tight may not be. Save yourself some money and worry: open the lids of your sumps and check beneath your dispensers weekly. If you have monitoring wells or observation wells in your tank pit, check them for free product. Have your sumps tested for tightness. If they were built tight, make sure they stay that way.

A line leak detector and sensor failed to detect free product in the sump to the left.

Coming changes to UST rules

Proposed rule changes for 2007 include Energy Policy Act of 2005 items (see page 7), and rules from 2005 that were delayed due to legislative inquiries and requests. Proposed changes include:

Cathodic Protection

Require use of corrosion inspection form and submittal to the DNR. Change inspection of impressed current systems to every year from every three years. Stipulate requirements of out of service cathodic protection.

Unstaffed cardtrol sites

Require checking the operation of the equipment once each day by owner/operator. Spill and overfill equipment inspected before and after product delivery and a requirement to use in-line leak detection equipment that shuts down the submersible pump in the event of a leak.

UST maintenance

Owner/operator visually inspects

all above ground pipe, connections and equipment for leaks at least once per month.

Temporary closure

Temporary closure is limited to three years, after which the system must be brought back into service or permanently closed.

Permanent closure

Tanks must be purged, monitored for combustible vapors, cleaned and the rinseate properly contained and disposed. Also added is the requirement of Chapter 136 to maintain insurance until after closure is completed.

Certified lab

A certified lab must conduct any analysis for petroleum or hazardous substance USTs. Only water and soil analysis was mentioned before.

Ball float valves banned

No more ball floats installed for

overflow prevention. Suction systems, generator tanks, remote fills with ball floats are not allowed.

The following are not proposed changes, but reminders of existing requirements:

High blend ethanol

Compatible components for high blend ethanol (greater than 10 percent) and compatibility inspection by Iowa licensed installers.

Leak detectors

An Automatic Line Leak Detection (ALLD) must be present on all UST systems with pressurized piping. The ALLD must be tested annually.

Statistical Inventory Reconciliation

SIR accepted as leak detection method.

Monthly monitoring

Tanks must be tested at or near the highest level filled.

New Enhanced Leak Detection technology shows prevention is key when it comes to leaks, financial savings

Current leak detection requirements for underground storage tank (UST) systems could be compared to a fire sprinkler system: it's designed to suppress the fire after it's already started.

But what happens if a tank leaks at a rate of 0.1 gph and it's not detected by the ATG system? That's 880 gallons or 6,000 pounds of product lost per year.

If your leak threshold is not set

at 0.1 gph or lower, you're going to miss this leak. At current gas prices, that's a loss of over \$2,000 per year, not to mention co-pay, liability and cleanup costs.

Prevention pays

Why allow a catastrophic loss when you can prevent one from occurring in the first place?

Iowa's leak detection requirements have been in place since the 1980s and yet everything else - materials, construction standards, codes, techniques and practices - has changed and improved. Why use the

same old compliance standards?

To use the analogy we started out with, it's better to prevent a fire from starting in the first place instead of depending on sprinkler systems. Would you rather pay for cleanup or prevention?

Better leak detection

The DNR will propose secondary containment on UST systems within 1,000 feet of a public or private well (2005 Energy Policy Act) to improve leak detection capability.

Enhanced Leak Detection

A new technology called Enhanced Leak Detection, or ELD, can detect a leak as small as 0.005 gph. That's so small it's not even observable to the naked eye; it's a vapor leak. Why measure for vapors? Because vapors contribute to significant increases in contaminant levels in soil and groundwater, and vapor leaks can turn into liquid leaks.

ELD is similar to the Tracer Tight® method except it is much more sensitive, and mobile lab technology provides immediate results. When used as part of new tank installation procedure, the problem is repaired as soon as it's identified because the installer is onsite.

ELD works by introducing a "tracer" compound into the UST system. After the tracer is pulled through the system, any leak locations from imperfections in materials to installation mistakes are identified through sampling.

ELD improvements

ELD has been refined and improved through extensive use and experience in California, where ELD is required at all new UST installations and at all existing single-walled UST systems within 1,000 feet of a public drinking water well.

Not only has the test method improved, but California UST contractors have also improved installation of new UST systems. Since ELD reveals imperfections in the material



Workers installing a UST system insert drop tubes while they perform Enhanced Leak Detection (ELD) testing.

If an owner/operator conducts monthly monitoring on his or her tanks with an automatic tank gauging system (ATG), he or she is in technical compliance by meeting the 0.2 gallon per hour (gph) leak rate requirement.



Testing secondary piping by introducing a tracer between the primary and secondary lines. Samples are collected every 3 feet.

and the construction, installers are wise to where the leaks occur, can expeditiously make repairs during construction and can avoid making the same mistake twice.

In addition, Florida has drafted rules to require ELD testing on all new installations. Shell Oil Company has contracted with Praxair to conduct ELD commission tests on several installations in the Chicago area. Shell, California and other states realize that new UST systems can be regulatory “tight” upon commissioning, but still leak.

What the studies mean

As you can see, it is possible for a system to be in technical compliance (0.2 gph monthly monitoring or less) and still have an ongoing release. Work is ongoing to develop a way for UST systems to be assured tight when they are installed. Commissioning tests at installations are the most promising application for ELD testing.

Owners and operators can have the satisfaction of knowing they did the most they could do to save money, protect groundwater and avoid future problems. The public also takes notice if a petroleum marketer does more than the status quo or more than what is required.

Additional ELD applications

ELD is also used at leaking underground storage tank (LUST) sites with active tank systems where free product or elevated levels of contaminants show up in monitoring wells.

In many cases, these sites pass 0.1 gph and 0.2 gph tightness tests and are in technical compliance, but because the contaminants remain

elevated or free product shows up in wells where it hadn’t been before, it may suggest an ongoing, undetected release.

ELD testing has the sensitivity to find such a release and identify it quickly. Remember, a leak is declared at the leak threshold; if the threshold is set at 0.005 gph then that is technically a leak and is enforceable.

ELD testing

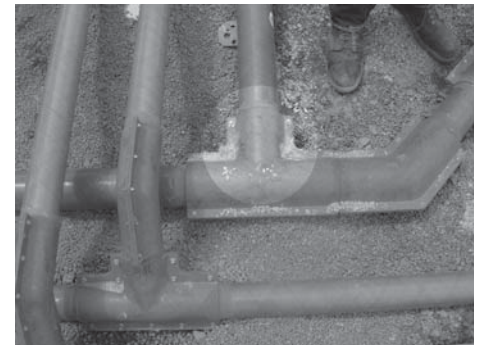
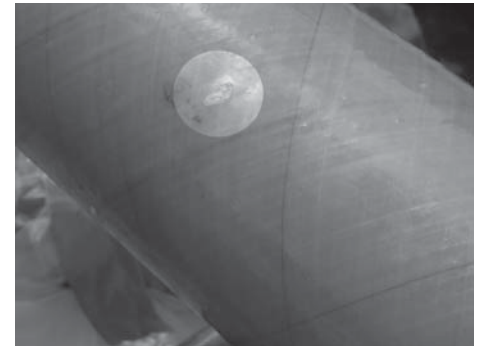
Iowa is already benefiting from ELD testing even though it has not yet been conducted in the state. ELD testing in California and Florida reveal where most leaks occur in UST systems:

- Spill buckets (base joint connections, damaged plastic or metal)
- Piping and pipe connections
- Tanks
- Dispensers (fittings, gaskets, seals)
- Submersible pumps
- Automatic line leak detectors
- Automatic tank gauge access riser caps and signal cable penetrations
- Improper joints, improperly seated rings and gaskets, moving joints while curing
- Threaded fittings, pipe dope, fiberglass reinforced plastic (FRP) to steel, scarred threads from bad dyes
- Bruised or crimped piping and flex connectors
- Shear valves

ELD can provide a more accurate method of leak detection upon commissioning a UST system than methods capable of detecting only liquid or 0.1 gph leaks.

Yes, ELD adds to the cost of installation, but when it comes to an

investment of hundreds of thousands of dollars, it makes sense to start with a tight system and keep your money and your product contained. “Regulatory tight” just isn’t enough any more.



Top right: Enhanced Leak Detection (ELD) testing found the two leaks (highlighted by the circles) at left that were undetectable with conventional testing.

Bottom right: The laptop (top) with leak detection software, is just one part of the mobile lab (bottom) that can analyze samples on-site.

Monitoring wells: placement and maintenance important

The metal caps spaced across your site are more than just something your customers drive over everyday. Those are monitoring wells, used to sample water quality and measure groundwater levels.

These wells can be used to evaluate if a fuel release has occurred from your tank system, the extent of site contamination, and

where a contaminant plume might be moving.

Those same wells, which can provide such critical information about the groundwater and soil beneath your site, can become a nightmare if they are not well-maintained and protected.

A monitoring well that is damaged and/or poorly maintained can

act as a conduit, funneling contaminants from the surface to the subsurface. This can turn an existing contamination problem into a much bigger one, or it can create new problems.

The series of images shown here demonstrate examples of damage to wells or poor handling practices that result in problems.



Photo 1: Petroleum spills can and do happen at gas stations. Maybe a customer's car leaks gas and oil that runs into wells. Or on a grander scale, maybe the dispenser doesn't shut off or the fuel transporter looks away. You could soon have a stream of petroleum flowing across your site.



If this monitoring well is not in good condition, that fuel could be funneled straight to the subsurface. The area around a monitoring well should be sloped away from the well in order to keep surface runoff out.



Photo 2: This well has no cap and no locking mechanism, making it vulnerable to contamination. You also need to keep in mind that most monitoring wells need to be sampled periodically or checked for free product. If the well stays open and fills up with dirt, you may have to replace it.



Photo 3: This is not a good place for a permanent monitoring well. Product can leak from the dispenser, the hose or nozzle, or all three, and into the annular fill (material around the monitoring well). This would likely go down the well itself into groundwater. Monitoring wells should be clearly marked as such so they are not confused with underground tank fill pipes.



Monitoring wells in good condition are designed to reduce the likelihood of infiltration by surface contaminants. This is done through use of bentonite pellets around the casing and concrete to seal the mount and cap.

However, even if you have a cap and locking device on your monitoring well,

if it is not maintained properly, petroleum may still enter the well through cracks in the well casing or openings in the protective bentonite seal.

Photo 4: Even correctly maintained monitoring wells get damaged by frost heave, snowplows and traffic. Even though the weather may be beyond your control, some of this can be prevented by placing protective posts around monitoring wells in obscure locations and careful snow removal activities in areas near monitoring wells.

Photo 5: If any of the monitoring wells installed at your site—on or off your property—become damaged or destroyed, alert your certified groundwater professional at your environmental consulting firm immediately. If your site is funded, contact GAB Robins at (515) 276-8046. The costs to plug, replace, or repair the well may be covered.

Proper monitoring well construction and maintenance

1. Provide for adequate surface drainage away from the well.
2. Properly label each well.
3. Secure each well with a bolted cover and/or a locked cap.
4. Replace damaged well caps and covers.
5. Place protective devices (e.g., concrete or metal posts) around monitoring wells.

Changes to Iowa UST program required by Federal Energy Act

The Iowa UST program is making changes as a result of provisions signed into law in August 2005 in the Energy Policy Act.

As a result, the DNR will write rules and make program changes to implement the provisions. Some of the new requirements may require legislative changes.

The provisions include new requirements for UST inspections, operator training, public availability of records, fuel delivery prohibition, and secondary containment near water supplies or requiring installers and manufacturers to have liability insurance.

The U.S. EPA is writing guidelines for states, which can be found at: www.epa.gov/swrust1/index.htm.

The Energy Policy Act contains the following provisions:

UST Inspections

All underground storage tanks not inspected since 1998 must be inspected by Aug. 8, 2007. This includes 136 Iowa sites as of July 2006.

The second part of the provision requires all USTs to be inspected every three years thereafter. Iowa is currently implementing the requirement for owners/operators to have UST systems inspected on a two-year inspection cycle by state-certified compliance inspectors.

Iowa should be able to meet this provision. EPA has not yet released draft guidelines on inspections.

Operator Training

EPA will develop UST operator training guidelines, in consultation with states, by Aug. 8, 2007. States are to develop state-specific training requirements consistent with EPA guidelines within two years of EPA publishing its guidelines.

The EPA has not yet released its draft guidelines on operator training. Iowa will be implementing new regulations to meet this provision. Implementation is not required until August 2009.

Public Record Requirements

This provision requires states to maintain and make available to the public a record of regulated USTs. The target date for states to make records available is December 2008. Public records of individual Iowa UST sites are already available at the DNR Records Center, in the Wallace State Office Building in Des Moines and at www.iowadnr.com/land/ust/ustdbindex.html. Additional information will be added to meet the new requirements.

Fuel Delivery Prohibition

States must develop a program for fuel delivery prohibition to facilities found out of operational compliance. Iowa already has a provision for prohibiting delivery (specifically, for unregistered tanks and tanks without documented financial responsibility).

However, Iowa UST regulations will be amended to include the operational compliance criteria for which

delivery is prohibited. States must implement this provision by Aug. 8, 2007.

Secondary Containment or Financial Responsibility/Installer Certification

States must require new USTs to have secondary containment if installed within 1,000 feet of a public water supply system *or* have certification for installers, and financial responsibility mechanisms required for installers and manufacturers of UST equipment.

The DNR will seek legislative changes to require secondary containment. EPA has not released final guidelines. States are to implement these by Feb. 8, 2007. Rules will not be ready by February.

The secondary containment requirement is a significant improvement in Iowa groundwater protection. Each new UST system, including tanks, piping and dispensers within 1,000 feet of an existing community water system or any existing potable water well, must be double wall or secondarily contained.

This includes dispensers with dispenser pans and piping with transition sumps and monitored as such. These changes would apply to existing UST systems only when they are replacing tanks, piping or dispensers.

The DNR will provide further information when final guidance from EPA is issued.

Other provisions that may affect Iowa's UST Program:

- States must give a compliance report on all government-owned tanks by Aug. 8, 2007.
- A prohibition for EPA to distribute funds currently given to support a state UST program if the state diverts money from its state assurance fund.
- Read full text of the new legislation from EPA: www.epa.gov/oust/fedlaws/publ_109-058.pdf (go to Title XV, Subtitle B - Underground Storage Tank Compliance, on pages 500-513)
- Read about EPA's ongoing work to implement the new legislation: www.epa.gov/oust/Energy%20Policy%20Act%20Update%203-06.pdf

UST Fund Board transfers licensing program

Under a 28E agreement with the UST Fund Board, the DNR UST Section will assume responsibility for the licensing program for installers, installation inspectors and testers. The transfer of the licensing program is to be completed by the end of the state fiscal year, June 30, 2007.

Legislation is needed for a change in statute to transfer the

licensing responsibilities to the DNR. A requirement that all new UST installations, repairs, equipment installs and technical upgrades be performed by an Iowa licensed installer will be included in recommended changes to the legislature.

AON Risk Services has administered the licensing program for the Fund Board since 2000.

E85 equipment deadline extended

The 2006 legislative session extended the deadline for E85 compatible dispensing equipment to July 1, 2009. House File 2754 extended the original July 1, 2007 deadline set by the DNR, Iowa Department of Public Safety and the Ethanol Coalition. The 2005 agreement gave time to Underwriters Laboratories (UL) and other

independent labs to approve an E85 compatible dispenser.

The extension is timely, as UL recently suspended authorization to use UL markings on fuel dispensing components for fuels that contain greater than 15 percent alcohol (ethanol). UL needs more time to conduct research into the corrosive nature of high blend ethanol fuels.

DNR Tanks Update

Published by the Iowa
Department of Natural Resources

Jeff Vonk, Director

Wayne Gieselman,
Administrator,
Environmental Services Division

Tim Hall, Bureau Chief,
Land Quality

Elaine Douskey, Supervisor,
Underground Storage Tank Section

Jessie Rolph Brown, Editor
Tom Collins, Contributor
Bonnie Garrison, Contributor
Paul Nelson, Contributor

Programs and activities are available to all potential clientele without regard to race, color, national origin, sex, handicap or age. Anyone who feels that he or she has been discriminated against should send a complaint within 180 days to the Iowa Civil Rights Commission, 211 E. Maple, second Floor, Des Moines, IA 50319.

**IOWA DEPARTMENT OF
NATURAL RESOURCES
Wallace State Office Building
Des Moines, IA 50319-0034**

PRSRT STD
U.S. POSTAGE
PAID
DES MOINES, IA
PERMIT NO. 1195